IEC 61300-2-50

Edition 2.0 2026-09

INTERNATIONAL STANDARD

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures -
Part 2-50: Tests - Fibre optic connector proof test with static load

ICS 33.180.20

ISBN 978-2-8327-1485-0

IEC 61300-2-50:2026-09(en)

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IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-50: Tests - Fibre optic connector proof test with static load

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IEC 61300-2-50 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics. It is an International Standard.

This second edition cancels and replaces the first edition published in 2007. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) addition of normative references to Clause 2;
b) addition of the terms and definitions clause;
c) addition of the straight pull test of pulling cap – plug – cable configuration;
d) modification of the test procedure including provisions for hardened connectors;

e) update of the severity of the test according to the component and performance category;

f) addition of the details to be specified and reported clause.

The text of this International Standard is based on the following documents:

Draft	Report on voting
86B/5246/FDIS	86B/5275/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of IEC 61300 series, published under the general title *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,

– withdrawn, or

– revised.

1 Scope

This part of IEC 61300 describes a test to quantitatively assess the capability of a connector terminating a reinforced cable of any diameter or a buffered fibre, both single-mode and multimode, to withstand static loads without uncoupling of the connector, physical damage to the assembly or permanent degradation of optical performance.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 61300-1, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance*

IEC 61300-2-38:2023, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-38: Tests - Sealing for fibre optic sealed closures and hardened connectors using air pressure*

IEC 61300-3-1, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-1: Examinations and measurements - Visual examination*

IEC 61300-3-3, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-3: Examinations and measurements - Active monitoring of changes in attenuation and return loss*

IEC 61300-3-35, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-35: Examinations and measurements - Visual inspection of fibre optic connectors and fibre-stub transceivers*

IEC 61753 (all parts), *Fibre optic interconnecting devices and passive components - Performance standards*

IEC 62005 (all parts), *Fibre optic interconnecting devices and passive components - Reliability*

IEC TR 62627-01, *Fibre optic interconnecting devices and passive components - Part 01: Fibre optic connector cleaning methods*

IEC TS 63334, *Fibre optic interconnecting devices and passive components - Conditions for testing the protection against dust and water ingress of passive optical protective housings and hardened fibre optic connectors (IP5X, IPX4, IPX5, IPX6)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61300-1 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

– IEC Electropedia: available at https://www.electropedia.org/

– ISO Online browsing platform: available at https://www.iso.org/obp

3.1
pulling cap
detachable component that protects connector plug's optical parts to which a pulling gear can be attached

4 General description

The proof test intends to simulate abrupt mechanical stress which can occur during installation and maintenance activities. The device under test (DUT) is a connector terminated to a cable and mated to the adaptor or pulling cap. Static loads are applied to the cable at 0° (straight pull) and at 90° (side pull) in relation to the connector axis and held for a fixed time, while the mated cable assembly is held fixed by the adaptor or socket or the pulling cap. The DUT is examined and measured for attenuation and return loss before and after the load is applied.

5 Apparatus

5.1 General

The apparatus for this test consists of a mounting fixture, a mandrel, and a force generator.

5.2 Mounting fixture

The mounting fixture consists of the test arm which can be rotated by 90°, and the bracket on which the adaptor or socket is mounted. It is shown in Figure 1 a). The DUT is flexed at the cable attachment point to the connector by rotating the test arm. The position of the cable assembly along the test arm should be adjusted so that, when the arm is at 90°, the centre line along which the cable hangs passes through the rotation point. The fixture shall be designed to withstand test loads without any deformation. The bracket shall have provision for mounting the adaptor at different orientations in respect to the position of the connector key.

The mounting fixture for pulling cap–plug–cable proof test consists of a rigidly fixed pulling gear attached to the pulling cap and is shown in Figure 1 b).

5.3 Mandrel

Diameter D of the mandrel shall not be smaller than the minimum bending diameter of the cable specified by the cable manufacturer, and shall not be smaller than 60 mm. The cable shall be secured to prevent slippage. Distance A between the rearmost portion of the DUT cable clamping component and the mandrel tangent point shall be 250 mm ± 50 mm.

5.4 Force generator

The required force can be achieved by applying weights in controlled increments to the mandrel. Guides shall be used to prevent the mandrel with attached weights from moving laterally relative to the rotation point, and they shall not dampen the force. Alternatively, a tensile test machine capable of gradually applying the specified force at the specified rate to the mandrel can be used.